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41 [Cluster resource management: An integrated experimental environment for distributed systems and networks](#)

Brian White, Jay Lepreau, Leigh Stoller, Robert Ricci, Shashi Guruprasad, Mac Newbold, Mike Hibler, Chad Barb, Abhijeet Joglekar

 December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI

 Full text available: [pdf\(2.10 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#)

Three experimental environments traditionally support network and distributed systems research: network emulators, network simulators, and live networks. The continued use of multiple approaches highlights both the value and inadequacy of each. Netbed, a descendant of Emulab, provides an experimentation facility that integrates these approaches, allowing researchers to configure and access networks composed of emulated, simulated, and wide-area nodes and links. Netbed's primary goals are ease ...

42 [Notable computer networks](#)

John S. Quarterman, Josiah C. Hoskins

 October 1986 **Communications of the ACM**, Volume 29 Issue 10

 Full text available: [pdf\(4.66 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Computer networks are becoming more numerous and more diverse. Collectively, they constitute a worldwide metanetwork.

43 [Is hierarchical public-key certification the next target for hackers?](#)

Mike Burmester, Yvo G. Desmedt

 August 2004 **Communications of the ACM**, Volume 47 Issue 8

 Full text available: [pdf\(173.38 KB\)](#)
[html\(27.53 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Considering alternatives to hierarchical authentication structures that are not sufficiently secure for communication on open networks such as the Internet.

44 [Systems 1: A wireless sensor network For structural monitoring](#)

Ning Xu, Sumit Rangwala, Krishna Kant Chintalapudi, Deepak Ganesan, Alan Broad, Ramesh Govindan, Deborah Estrin

 November 2004 **Proceedings of the 2nd international conference on Embedded networked sensor systems**


Full text available:  [pdf\(731.28 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Structural monitoring---the collection and analysis of structural response to ambient or forced excitation--is an important application of networked embedded sensing with significant commercial potential. The first generation of sensor networks for structural monitoring are likely to be data acquisition systems that collect data at a single node for centralized processing. In this paper, we discuss the design and evaluation of a wireless sensor network system (called Wisden for structural dat ...

Keywords: Wisden, sensor network, structural health monitoring

45 Trust management for IPsec

May 2002 **ACM Transactions on Information and System Security (TISSEC)**, Volume 5 Issue 2


Full text available:  [pdf\(321.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

IPsec is the standard suite of protocols for network-layer confidentiality and authentication of Internet traffic. The IPsec protocols, however, do not address the policies for how protected traffic should be handled at security end points. This article introduces an efficient policy management scheme for IPsec, based on the principles of trust management. A compliance check is added to the IPsec architecture that tests packet filters proposed when new security associations are created for confo ...

Keywords: Credentials, IPsec, KeyNote, network security, policy, trust management

46 Internet indirection infrastructure

Ion Stoica, Daniel Adkins, Shelley Zhuang, Scott Shenker, Sonesh Surana
August 2002 **ACM SIGCOMM Computer Communication Review , Proceedings of the 2002 conference on Applications, technologies, architectures, and protocols for computer communications**, Volume 32 Issue 4


Full text available:  [pdf\(303.69 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Attempts to generalize the Internet's point-to-point communication abstraction to provide services like multicast, anycast, and mobility have faced challenging technical problems and deployment barriers. To ease the deployment of such services, this paper proposes an overlay-based Internet Indirection Infrastructure (I3) that offers a rendezvous-based communication abstraction. Instead of explicitly sending a packet to a destination, each packet is associated with an identifier; this identifier ...

Keywords: abstraction, architecture, indirection, internet, scalable

47 Interoperability of multiple autonomous databases


Witold Litwin, Leo Mark, Nick Roussopoulos
September 1990 **ACM Computing Surveys (CSUR)**, Volume 22 Issue 3

Full text available:  [pdf\(2.66 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Database systems were a solution to the problem of shared access to heterogeneous files created by multiple autonomous applications in a centralized environment. To make data usage easier, the files were replaced by a globally integrated database. To a large extent, the idea was successful, and many databases are now accessible through local and long-haul networks. Unavoidably, users now need shared access to multiple autonomous databases. The question is what the corresponding methodology ...

48 Approximation of protein structure for fast similarity measures

Fabian Schwarzer, Itay Lotan

April 2003 **Proceedings of the seventh annual international conference on Computational molecular biology**Full text available:  [pdf\(212.43 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

It is shown that structural similarity between proteins can be decided well with much less information than what is used in common similarity measures. The full C α representation contains redundant information because of the inherent chain topology of proteins and a limit on their compactness due to excluded volume. A wavelet analysis on random chains and proteins justifies approximating subchains by their centers of mass. For not too compact chain-like structures in general, and ...

Keywords: approximation of structure, nearest-neighbor search, protein structure, similarity measures

49 An overview of the Andrew message system

J. Rosenberg, C. F. Everhart, N. S. Borenstein

August 1987 **ACM SIGCOMM Computer Communication Review , Proceedings of the ACM workshop on Frontiers in computer communications technology,**
Volume 17 Issue 5Full text available:  [pdf\(1.16 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**50 SIMD instruction cache**


Todd E. Rockoff

August 1994 **Proceedings of the sixth annual ACM symposium on Parallel algorithms and architectures**Full text available:  [pdf\(1.06 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

SIMD instruction cache (or I-cache) is proposed to remedy a heretofore un-compensated instruction delivery rate limitation of SIMD computers. This paper introduces the concept of SIMD I-cache and sketches the I-cache design space. On the basis of throughput using chip area as a hardware cost constraint, detailed evaluations of simple I-cache variants for a diverse set of sample problems are presented. Simple I-cache variants occupy negligible area in chips while providing significant speedu ...

51 The structure of Cedar

Daniel C. Swinehart, Polle T. Zellweger, Robert B. Hagmann

June 1985 **Proceedings of the ACM SIGPLAN 85 symposium on Language issues in programming environments,** Volume 20 , 18 Issue 7 , 6Full text available:  [pdf\(1.79 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an overview of the Cedar programming environment, focusing primarily on its overall structure: the major components of Cedar and the way they are organized. Cedar supports the development of programs written in a single programming language, also called Cedar. We will emphasize the extent to which the Cedar language, with runtime support, has influenced the organization, comprehensibility, and stability of Cedar. Produced in the Computer Science Laboratory (CS ...

52 Issues in implementing a real time embedded Data Base Management System in Ada

David Bunting, Leonard Bass

March 1986 **Proceedings of the third annual Washington Ada symposium on Ada: Ada**

use in focus : practical lessons in perspectiveFull text available:  [pdf\(901.52 KB\)](#) Additional Information: [full citation](#), [references](#)**53 Cooperation in MAS: Discovering and exploiting synergy between hierarchical planning agents** 

Jeffrey S. Cox, Edmund H. Durfee

July 2003 **Proceedings of the second international joint conference on Autonomous agents and multiagent systems**Full text available:  [pdf\(249.79 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

It is critical for agents in a multiagent environment to avoid interfering with each other when carrying out their tasks. However, to avoid execution inefficiencies, they also should capitalize on cooperative opportunities. In state oriented domains [14], identifying overlapping effects between agents' plans enables some agents to leave some tasks to others, thereby reducing the cost of execution and improving the overall efficiency of the multiagent system. This is what we term *synergy*. ...

Keywords: coordination of multiple agents, multiagent planning, plan merging, synergy

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Result page: [previous](#) [1](#) [2](#) [3](#) [next](#)Relevance scale ☐ ☐ ☐ ☐ ☐**21** [Storage: Multi-dimensional range queries in sensor networks](#)

Xin Li, Young Jin Kim, Ramesh Govindan, Wei Hong

November 2003 **Proceedings of the 1st international conference on Embedded networked sensor systems**Full text available: [pdf\(331.43 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In many sensor networks, data or events are named by attributes. Many of these attributes have scalar values, so one natural way to query events of interest is to use a *multi-dimensional* range query. An example is: "List all events whose temperature lies between 50° and 60°, and whose light levels lie between 10 and 15." Such queries are useful for correlating events occurring within the network. In this paper, we describe the design of a distributed index that scalably supports ...

Keywords: DIM, multi-dimensional range queries**22** [The geometric maximum traveling salesman problem](#)

Alexander Barvinok, Sándor P. Fekete, David S. Johnson, Arie Tamir, Gerhard J. Woeginger, Russ Woodroffe

September 2003 **Journal of the ACM (JACM)**, Volume 50 Issue 5Full text available: [pdf\(263.20 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We consider the traveling salesman problem when the cities are points in \mathbb{R}^d for some fixed d and distances are computed according to geometric distances, determined by some norm. We show that for any polyhedral norm, the problem of finding a tour of *maximum* length can be solved in polynomial time. If arithmetic operations are assumed to take unit time, our algorithms run in time $O(n^{f-2} \log n)$, where $f \dots$

Keywords: Euclidean metric, NP-hardness, Traveling salesman problem, maximum scatter TSP, optimization, polyhedral metric, polynomial time**23** [Survey articles: Data mining for hypertext: a tutorial survey](#)

Soumen Chakrabarti

January 2000 **ACM SIGKDD Explorations Newsletter**, Volume 1 Issue 2Full text available: [pdf\(1.19 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

With over 800 million pages covering most areas of human endeavor, the World-wide Web is a fertile ground for data mining research to make a difference to the effectiveness of information search. Today, Web surfers access the Web through two dominant interfaces: clicking on hyperlinks and searching via keyword queries. This process is often tentative and unsatisfactory. Better support is needed for expressing one's information need and dealing with a search result in more structured ways than av ...

24 Rendering vector data over global, multi-resolution 3D terrain

Zachary Wartell, Eunjung Kang, Tony Wasilewski, William Ribarsky, Nickolas Faust
May 2003 **Proceedings of the symposium on Data visualisation 2003**


Full text available:  [pdf\(2.51 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Modern desktop PCs are capable of taking 2D Geographic Information System (GIS) applications into the realm of interactive 3D virtual worlds. In prior work we developed and presented graphics algorithms and data management methods for interactive viewing of a 3D global terrain system for desktop and virtual reality systems. In this paper we present a key data structure and associated render-time algorithm for the combined display of multi-resolution 3D terrain and traditional GIS polyline vector ...



25 XML manipulations: Lazy XML processing

Markus L. Noga, Steffen Schott, Welf Löwe
November 2002 **Proceedings of the 2002 ACM symposium on Document engineering**

Full text available:  [pdf\(197.96 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper formalizes the domain of tree-based XML processing and classifies several implementation approaches. The lazy approach, an original contribution, is presented in depth. Proceeding from experimental measurements, we derive a selection strategy for implementation approaches to maximize performance.

Keywords: XML, document object model, lazy evaluation, parsing



26 Launching the new era

Kazuhiro Fuchi, Robert Kowalski, Koichi Furukawa, Kazunori Ueda, Ken Kahn, Takashi Chikayama, Evan Tick
March 1993 **Communications of the ACM**, Volume 36 Issue 3

Full text available:  [pdf\(3.45 MB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#), [review](#)



27 Protecting information on the Web


Elisa Bertino, Elena Pagani, Gian Paolo Rossi, Pierangela Samarati
November 2000 **Communications of the ACM**

Full text available:  [pdf\(461.10 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



28 Enterprise Role Administration: The role control center: features and case studies

David F. Ferraiolo, R. Chandramouli, Gail-Joon Ahn, Serban I. Gavrila
June 2003 **Proceedings of the eighth ACM symposium on Access control models and technologies**

Full text available:  [pdf\(779.58 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Role-based Access Control (RBAC) models have been implemented not only in self-



contained resource management products such as DBMSs and Operating Systems but also in a class of products called Enterprise Security Management Systems (ESMS). ESMS products are used for centralized management of authorizations for resources resident in several heterogeneous systems (called target systems) distributed throughout the enterprise. The RBAC model used in an ESMS is called the Enterprise RBAC model (ERBAC ...

Keywords: administrative roles, authorization management, role graph, role hierarchy, separation of duty

29 Proposed NIST standard for role-based access control

David F. Ferraiolo, Ravi Sandhu, Serban Gavrila, D. Richard Kuhn, Ramaswamy Chandramouli
August 2001 **ACM Transactions on Information and System Security (TISSEC)**, Volume 4
Issue 3

Full text available:  [pdf\(417.90 KB\)](#)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this article we propose a standard for role-based access control (RBAC). Although RBAC models have received broad support as a generalized approach to access control, and are well recognized for their many advantages in performing large-scale authorization management, no single authoritative definition of RBAC exists today. This lack of a widely accepted model results in uncertainty and confusion about RBAC's utility and meaning. The standard proposed here seeks to resolve this situation by u ...

Keywords: Role-based access control, access control, authorization management, security, standards

30 A structural view of the Cedar programming environment

Daniel C. Swinehart, Polle T. Zellweger, Richard J. Beach, Robert B. Hagmann
August 1986 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,
Volume 8 Issue 4

Full text available:  [pdf\(6.32 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an overview of the Cedar programming environment, focusing on its overall structure—that is, the major components of Cedar and the way they are organized. Cedar supports the development of programs written in a single programming language, also called Cedar. Its primary purpose is to increase the productivity of programmers whose activities include experimental programming and the development of prototype software systems for a high-performance personal computer. T ...

31 Replication for web hosting systems

Swaminathan Sivasubramanian, Michal Szymaniak, Guillaume Pierre, Maarten van Steen
September 2004 **ACM Computing Surveys (CSUR)**, Volume 36 Issue 3

Full text available:  [pdf\(374.99 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Replication is a well-known technique to improve the accessibility of Web sites. It generally offers reduced client latencies and increases a site's availability. However, applying replication techniques is not trivial, and various Content Delivery Networks (CDNs) have been created to facilitate replication for digital content providers. The success of these CDNs has triggered further research efforts into developing advanced <i>Web replica hosting systems</i>. These are systems that ...

Keywords: Web replication, content delivery networks

32 Storage: An evaluation of multi-resolution storage for sensor networks

Deepak Ganesan, Ben Greenstein, Denis Perelyubskiy, Deborah Estrin, John Heidemann
November 2003 **Proceedings of the 1st international conference on Embedded networked sensor systems**

Full text available:  [pdf\(299.34 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Wireless sensor networks enable dense sensing of the environment, offering unprecedented opportunities for observing the physical world. Centralized data collection and analysis adversely impact sensor node lifetime. Previous sensor network research has, therefore, focused on in network aggregation and query processing, but has done so for applications where the features of interest are known a priori. When features are not known a priori, as is the case with many scientific applications in dens ...

33 Session 2: mathematical algorithms: Control strategies for parallel mixed integer branch and bound

Jonathan Eckstein
November 1994 **Proceedings of the 1994 ACM/IEEE conference on Supercomputing**

Full text available:  [pdf\(1.05 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Mixed integer programs are numerical optimization problems that arise frequently in operations research, particularly in industrial logistics and tactical planning. Their classical solution method is a tree-search branch and bound algorithm in which each tree node represents a linear program. This paper describes an implementation of general mixed integer branch and bound that runs on the CM5 family of parallel processors. This code allows varying amounts of centralization, and combines the rand ...

34 Special issue on computational phonology: Phonological analysis in typed feature systems

Steven Bird, Ewan Klein
September 1994 **Computational Linguistics**, Volume 20 Issue 3

Full text available:  [pdf\(2.19 MB\)](#)  Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)
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Research on constraint-based grammar frameworks has focused on syntax and semantics largely to the exclusion of phonology. Likewise, current developments in phonology have generally ignored the technical and linguistic innovations available in these frameworks. In this paper we suggest some strategies for reuniting phonology and the rest of grammar in the context of a uniform constraint formalism. We explain why this is a desirable goal, and we present some conservative extensions to current pra ...

35 Managing multiple and distributed ontologies on the Semantic Web

A. Maedche, B. Motik, L. Stojanovic
November 2003 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 12 Issue 4

Full text available:  [pdf\(375.18 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

In traditional software systems, significant attention is devoted to keeping modules well separated and coherent with respect to functionality, thus ensuring that changes in the system are localized to a handful of modules. Reuse is seen as the key method in reaching that goal. Ontology-based systems on the Semantic Web are just a special class of software systems, so the same principles apply. In this article, we present an integrated framework for managing multiple and distributed ontologies o ...

Keywords: Multiple and distributed ontologies, Ontology evolution

36 Integrated learning for interactive synthetic characters

Bruce Blumberg, Marc Downie, Yuri Ivanov, Matt Berlin, Michael Patrick Johnson, Bill Tomlinson

July 2002 **ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques**, Volume 21 Issue 3

Full text available: [pdf\(488.66 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The ability to learn is a potentially compelling and important quality for interactive synthetic characters. To that end, we describe a practical approach to real-time learning for synthetic characters. Our implementation is grounded in the techniques of reinforcement learning and informed by insights from animal training. It simplifies the learning task for characters by (a) enabling them to take advantage of predictable regularities in their world, (b) allowing them to make maximal use of any ...

Keywords: animation, behavioral animation, computer games

37 Message addressing schemes

D. Tschritzis

January 1984 **ACM Transactions on Information Systems (TOIS)**, Volume 2 Issue 1

Full text available: [pdf\(1.40 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

38 Multiview access protocols for large-scale replication

Xiangning Liu, Abdelsalam Helal, Weimin Du

June 1998 **ACM Transactions on Database Systems (TODS)**, Volume 23 Issue 2

Full text available: [pdf\(365.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The article proposes a scalable protocol for replication management in large-scale replicated systems. The protocol organizes sites and data replicas into a tree-structured, hierarchical cluster architecture. The basic idea of the protocol is to accomplish the complex task of updating replicated data with a very large number of replicas by a set of related but independently committed transactions. Each transaction is responsible for updating replicas in exactly one cluster and invoking add ...

Keywords: data replication, large-scale systems, multiview access

39 Delegation logic: A logic-based approach to distributed authorization

Ninghui Li, Benjamin N. Grosof, Joan Feigenbaum

February 2003 **ACM Transactions on Information and System Security (TISSEC)**, Volume 6 Issue 1

Full text available: [pdf\(316.24 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We address the problem of authorization in large-scale, open, distributed systems. Authorization decisions are needed in electronic commerce, mobile-code execution, remote resource sharing, privacy protection, and many other applications. We adopt the trust-management approach, in which "authorization" is viewed as a "*proof-of-compliance*" problem: Does a set of credentials prove that a request complies with a policy? We develop a logic-based language, called *Delegation Logic* (DL), t ...

Keywords: Access control, Delegation Logic, distributed system security, logic programs, trust management

40 Pen computing: a technology overview and a vision

André Meyer

July 1995 **ACM SIGCHI Bulletin**, Volume 27 Issue 3Full text available:  [pdf\(5.14 MB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions. Starting with a short historic ...

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1 [Heuristics, Experimental Subjects, and Treatment Evaluation in Bigraph Crossing Minimization](#)

Matthias Stallmann, Franc Brglez, Debabrata Ghosh

January 2001 **Journal of Experimental Algorithmics (JEA)**, Volume 6

Full text available: pdf(858.74 KB)

ps(3.01 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The bigraph crossing problem, embedding the two node sets of a bipartite graph along two parallel lines so that edge crossings are minimized, has applications to circuit layout and graph drawing. Experimental results for several previously known and two new heuristics suggest continued exploration of the problem, particularly sparse instances. We emphasize careful design of experimental subject classes and present novel views of the results. All source code, data, and scripts are available on-li ...

Keywords: crossing number, design of experiments, graph drawing, graph embedding, graph equivalence classes, layout

2 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available: pdf(4.21 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

3 [Tree-based group key agreement](#)

Yongdae Kim, Adrian Perrig, Gene Tsudik

February 2004 **ACM Transactions on Information and System Security (TISSEC)**, Volume 7
Issue 1

Full text available: pdf(573.70 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Secure and reliable group communication is an active area of research. Its popularity is fueled by the growing importance of group-oriented and collaborative applications. The central research challenge is secure and efficient group key management. While centralized methods are often appropriate for key distribution in large multicast-style groups, many collaborative group settings require distributed key agreement techniques. This work investigates a novel group key agreement approach which ble ...

Keywords: communication complexity, cryptographic protocols, group communication, group key agreement, security

4 Simplified kinetic connectivity for rectangles and hypercubes

John Hersherberger, Subhash Suri

January 2001 **Proceedings of the twelfth annual ACM-SIAM symposium on Discrete algorithms**

Full text available:  [pdf\(871.19 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We consider the problem of maintaining connected components in a set of moving objects using the kinetic data structure (KDS) framework. We assume that the motion of each object can be specified by a low-degree algebraic trajectory; this trajectory, however, can be modified in an on-line fashion. While the objects move continuously, their connectivity changes at discrete times. A straightforward dynamic graph approach for maintaining connectivity of n objects has three shortcomings: th ...

5 Security in VANET: Efficient attribute authentication with applications to ad hoc networks

Markus Jakobsson, Susanne Wetzel

October 2004 **Proceedings of the first ACM workshop on Vehicular ad hoc networks**

Full text available:  [pdf\(194.82 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


We present a family of certification methods with applications to attribute certification, which in turn has ample applications to ad hoc networks by way of the use of centrally managed recommendation mechanisms. Our construction is based on a Merkle tree consisting of subtrees, each of which corresponds to some aspect of an attribute. We study how the ordering of these subtrees can impact the cost of representing, maintaining, and verifying attribute certificates. We describe the applicability ...

Keywords: attribute authority, certificate, cryptography, hash graphs, light-weight, recommendation, spatial Merkle tree

6 Data clustering: a review

A. K. Jain, M. N. Murty, P. J. Flynn

September 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 3

Full text available:  [pdf\(636.24 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Clustering is the unsupervised classification of patterns (observations, data items, or feature vectors) into groups (clusters). The clustering problem has been addressed in many contexts and by researchers in many disciplines; this reflects its broad appeal and usefulness as one of the steps in exploratory data analysis. However, clustering is a difficult problem combinatorially, and differences in assumptions and contexts in different communities has made the transfer of useful generic co ...

Keywords: cluster analysis, clustering applications, exploratory data analysis, incremental clustering, similarity indices, unsupervised learning

7 Special Section on Science of Network Design: On the scaling of congestion in the internet graph

Aditya Akella, Shuchi Chawla, Arvind Kannan, Srinivasan Seshan

July 2004 **ACM SIGCOMM Computer Communication Review**, Volume 34 Issue 3

Full text available:  pdf(671.18 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As the Internet grows in size, it becomes crucial to understand how the speeds of links in the network must improve in order to sustain the pressure of new end-nodes being added each day. Although the speeds of links in the core and at the edges improve roughly according to Moore's law, this improvement alone might not be enough. Indeed, the structure of the Internet graph and routing in the network might necessitate much faster improvements in the speeds of key links in the network.


I ...

Keywords: congestion, power-law graphs, shortest path routing

8 Distributed operating systems

Andrew S. Tanenbaum, Robbert Van Renesse

December 1985 **ACM Computing Surveys (CSUR)**, Volume 17 Issue 4

Full text available:  pdf(5.49 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Distributed operating systems have many aspects in common with centralized ones, but they also differ in certain ways. This paper is intended as an introduction to distributed operating systems, and especially to current university research about them. After a discussion of what constitutes a distributed operating system and how it is distinguished from a computer network, various key design issues are discussed. Then several examples of current research projects are examined in some detail ...

9 A parallel shortest augmenting path algorithm for the assignment problem

Egon Balas, Donald Miller, Joseph Pekny, Paolo Toth

October 1991 **Journal of the ACM (JACM)**, Volume 38 Issue 4

Full text available:  pdf(1.35 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

Keywords: assignment, matching, shortest augmenting paths, traveling salesman problem

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Ralph D. Hill, Tom Brinck, Steven L. Rohall, John F. Patterson, Wayne Wilner

June 1994 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 1 Issue 2

Full text available:  pdf(3.25 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

When people have meetings or discussions, frequently they use conversational props: physical models, drawings, or other concrete representations of information used to enhance the exchange of information. If the participants are geographically separated, it is difficult to make effective use of props since each physical prop can only exist in one place. Computer applications that allow two or more users to simultaneously view and manipulate the same data can be used to augm ...

Keywords: CSCW, UIMS, constraint maintenance, synchronous groupware

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October 2003 **Proceedings of the 1st ACM workshop on Security of ad hoc and sensor networks**

Full text available:  pdf(146.93 KB)

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Keywords: MANET, certificate path discovery, public key infrastructure, security

12 Locating application data across service discovery domains

Paul Castro, Benjamin Greenstein, Richard Muntz, Parviz Kermani, Chatschik Bisdikian, Maria Papadopoulou

July 2001 **Proceedings of the 7th annual international conference on Mobile computing and networking**

Full text available:  pdf(4.38 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The bulk of proposed pervasive computing devices such as PDAs and cellular telephones operate as thin clients within a larger infrastructure. To access services within their local environment, these devices participate in a service discovery protocol which involves a master directory that registers all services available in the local environment. These directories typically are isolated from each other. Devices that move across service discovery domains have no access to information outside t ...

13 Aggregation: Medians and beyond: new aggregation techniques for sensor networks

Nisheeth Shrivastava, Chiranjeev Buragohain, Divyakant Agrawal, Subhash Suri

November 2004 **Proceedings of the 2nd international conference on Embedded networked sensor systems**

Full text available:  pdf(287.99 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Wireless sensor networks offer the potential to span and monitor large geographical areas inexpensively. Sensors, however, have significant power constraint (battery life), making communication very expensive. Another important issue in the context of sensor-based information systems is that individual sensor readings are inherently unreliable. In order to address these two aspects, sensor database systems like TinyDB and Cougar enable in-network data aggregation to reduce the communication c ...

Keywords: aggregation, approximation algorithms, distributed algorithms, sensor networks

14 Connection architecture and protocols to support efficient handoffs over an ATM/B-ISDN personal communications network

Oliver T. W. Yu, Victor C. M. Leung

October 1996 **Mobile Networks and Applications**, Volume 1 Issue 2


Full text available:  [pdf\(960.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The next generation personal communication network will likely interconnect wireless networks via the ATM/B-ISDN to enable ubiquitous broadband personal communication services. Support of user terminal mobility, particularly the capability for fast and seamless handoffs, over the ATM/B-ISDN is an expected requirement that is not currently met. We propose extensions to the ATM/B-ISDN user transport and signaling network architectures and signaling protocols to meet these requirements. The ne ...

15 Session 9B: Near-optimal network design with selfish agents

Elliot Anshelevich, Anirban Dasgupta, Eva Tardos, Tom Wexler

June 2003 **Proceedings of the thirty-fifth annual ACM symposium on Theory of computing**

Full text available:  [pdf\(241.72 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


We introduce a simple network design game that models how independent selfish agents can build or maintain a large network. In our game every agent has a specific connectivity requirement, i.e. each agent has a set of terminals and wants to build a network in which his terminals are connected. Possible edges in the network have costs and each agent's goal is to pay as little as possible. Determining whether or not a Nash equilibrium exists in this game is NP-complete. However, when the goal of e ...

Keywords: network design, price of anarchy

16 Astrolabe: A robust and scalable technology for distributed system monitoring, management, and data mining

Robbert Van Renesse, Kenneth P. Birman, Werner Vogels

May 2003 **ACM Transactions on Computer Systems (TOCS)**, Volume 21 Issue 2

Full text available:  [pdf\(341.62 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Scalable management and self-organizational capabilities are emerging as central requirements for a generation of large-scale, highly dynamic, distributed applications. We have developed an entirely new distributed information management system called Astrolabe. Astrolabe collects large-scale system state, permitting rapid updates and providing on-the-fly attribute aggregation. This latter capability permits an application to locate a resource, and also offers a scalable way to track sys ...

Keywords: Aggregation, epidemic protocols, failure detection, gossip, membership, publish-subscribe, scalability

17 Document Formatting Systems: Survey, Concepts, and Issues

Richard Furuta, Jeffrey Scofield, Alan Shaw

September 1982 **ACM Computing Surveys (CSUR)**, Volume 14 Issue 3

Full text available:  [pdf\(5.36 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

18 Active database systems

Norman W. Paton, Oscar Díaz

March 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 1

Full text available:  [pdf\(2.68 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

[terms](#), [review](#)

Active database systems support mechanisms that enable them to respond automatically to events that are taking place either inside or outside the database system itself. Considerable effort has been directed towards improving understanding of such systems in recent years, and many different proposals have been made and applications suggested. This high level of activity has not yielded a single agreed-upon standard approach to the integration of active functionality with conventional databa ...

Keywords: active databases, events, object-oriented databases, relational databases

19 [Scheduling and resource allocation: SHARP: an architecture for secure resource peering](#)



Yun Fu, Jeffrey Chase, Brent Chun, Stephen Schwab, Amin Vahdat

October 2003 **Proceedings of the nineteenth ACM symposium on Operating systems principles**

Full text available:  [pdf\(339.51 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents Sharp, a framework for secure distributed resource management in an Internet-scale computing infrastructure. The cornerstone of Sharp is a construct to represent cryptographically protected resource <it>claims</it>---promises or rights to control resources for designated time intervals---together with secure mechanisms to subdivide and delegate claims across a network of resource managers. These mechanisms enable flexible <it>resource peeri ...


Keywords: peer-to-peer, resource allocation, resource peering

20 [An access control framework for multi-user collaborative environments](#)



Adrian Bullock, Steve Benford

November 1999 **Proceedings of the international ACM SIGGROUP conference on Supporting group work**

Full text available:  [pdf\(1.55 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A vital component of any application or environment is security, and yet this is often one of the lower priorities, losing out to performance and functionality issues, if it is considered at all. This paper considers a spatial approach to enabling, understanding and managing access control that is generally applicable across a range of collaborative environments and applications. Access control is governed according to the space within which subjects and objects reside, and the ability to t ...

Keywords: access control, collaborative systems, security

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1 [Heuristics, Experimental Subjects, and Treatment Evaluation in Bigraph Crossing Minimization](#)

Matthias Stallmann, Franc Brglez, Debabrata Ghosh

 January 2001 **Journal of Experimental Algorithmics (JEA)**, Volume 6

 Full text available: [pdf\(858.74 KB\)](#)
[ps\(3.01 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The bigraph crossing problem, embedding the two node sets of a bipartite graph along two parallel lines so that edge crossings are minimized, has applications to circuit layout and graph drawing. Experimental results for several previously known and two new heuristics suggest continued exploration of the problem, particularly sparse instances. We emphasize careful design of experimental subject classes and present novel views of the results. All source code, data, and scripts are available on-li ...

Keywords: crossing number, design of experiments, graph drawing, graph embedding, graph equivalence classes, layout

2 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren

 November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

 Full text available: [pdf\(4.21 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

3 [Expander flows, geometric embeddings and graph partitioning](#)

Sanjeev Arora, Satish Rao, Umesh Vazirani

 June 2004 **Proceedings of the thirty-sixth annual ACM symposium on Theory of computing**

 Full text available: [pdf\(241.59 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We give a $O(\sqrt{\log n})$ -approximation algorithm for sparsest cut, balanced separator, and graph conductance problems. This improves the $O(\log n)$ -approximation of Leighton and Rao (1988). We use a well-known semidefinite relaxation with triangle inequality constraints. Central to our analysis is a geometric theorem about projections of point sets in \mathbb{R}^d , whose proof makes essential use of a phenomenon called measure concentration. We also describe an interes ...

4 Simplified kinetic connectivity for rectangles and hypercubes

John Hershberger, Subhash Suri

January 2001 **Proceedings of the twelfth annual ACM-SIAM symposium on Discrete algorithms**

Full text available:  [pdf\(871.19 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We consider the problem of maintaining connected components in a set of moving objects using the kinetic data structure (KDS) framework. We assume that the motion of each object can be specified by a low-degree algebraic trajectory; this trajectory, however, can be modified in an on-line fashion. While the objects move continuously, their connectivity changes at discrete times. A straightforward dynamic graph approach for maintaining connectivity of n objects has three shortcomings: th ...

5 Security in VANET: Efficient attribute authentication with applications to ad hoc networks

Markus Jakobsson, Susanne Wetzal

October 2004 **Proceedings of the first ACM workshop on Vehicular ad hoc networks**

Full text available:  [pdf\(194.82 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


We present a family of certification methods with applications to attribute certification, which in turn has ample applications to ad hoc networks by way of the use of centrally managed recommendation mechanisms. Our construction is based on a Merkle tree consisting of subtrees, each of which corresponds to some aspect of an attribute. We study how the ordering of these subtrees can impact the cost of representing, maintaining, and verifying attribute certificates. We describe the applicability ...

Keywords: attribute authority, certificate, cryptography, hash graphs, light-weight, recommendation, spatial Merkle tree

6 Distributed operating systems

Andrew S. Tanenbaum, Robbert Van Renesse

December 1985 **ACM Computing Surveys (CSUR)**, Volume 17 Issue 4

Full text available:  [pdf\(5.49 MB\)](#)

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7 Data clustering: a review

A. K. Jain, M. N. Murty, P. J. Flynn

September 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 3

Full text available:  [pdf\(636.24 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Clustering is the unsupervised classification of patterns (observations, data items, or feature vectors) into groups (clusters). The clustering problem has been addressed in many contexts and by researchers in many disciplines; this reflects its broad appeal and usefulness as one of the steps in exploratory data analysis. However, clustering is a difficult problem combinatorially, and differences in assumptions and contexts in different communities has made the transfer of useful generic co ...

Keywords: cluster analysis, clustering applications, exploratory data analysis, incremental clustering, similarity indices, unsupervised learning

8 Special Section on Science of Network Design: On the scaling of congestion in the internet graph



Aditya Akella, Shuchi Chawla, Arvind Kannan, Srinivasan Seshan

July 2004 **ACM SIGCOMM Computer Communication Review**, Volume 34 Issue 3

Full text available:  pdf(671.18 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As the Internet grows in size, it becomes crucial to understand how the speeds of links in the network must improve in order to sustain the pressure of new end-nodes being added each day. Although the speeds of links in the core and at the edges improve roughly according to Moore's law, this improvement alone might not be enough. Indeed, the structure of the Internet graph and routing in the network might necessitate much faster improvements in the speeds of key links in the network.

I ...


Keywords: congestion, power-law graphs, shortest path routing

9 A parallel shortest augmenting path algorithm for the assignment problem



Egon Balas, Donald Miller, Joseph Pekny, Paolo Toth

October 1991 **Journal of the ACM (JACM)**, Volume 38 Issue 4

Full text available:  pdf(1.35 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

Keywords: assignment, matching, shortest augmenting paths, traveling salesman problem

10 RBAC support in object-oriented role databases



Raymond K. Wong

November 1997 **Proceedings of the second ACM workshop on Role-based access control**

Full text available:  pdf(1.45 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)


Keywords: database security, object-oriented role database, role-based access control

11 A role-based access control model and reference implementation within a corporate intranet



David F. Ferraiolo, John F. Barkley, D. Richard Kuhn

February 1999 **ACM Transactions on Information and System Security (TISSEC)**, Volume 2 Issue 1

Full text available:  [pdf\(252.60 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes NIST's enhanced RBAC model and our approach to designing and implementing RBAC features for networked Web servers. The RBAC model formalized in this paper is based on the properties that were first described in Ferraiolo and Kuhn [1992] and Ferraiolo et al. [1995], with adjustments resulting from experience gained by prototype implementations, market analysis, and observations made by Jansen [1988] and Hoffman [1996]. The implementation of RBAC for the Web (RBAC/Web) p ...


Keywords: RBAC, Web arrows, World Wide Web, access control, authorization management, role based access

12 Authentication: An approach to certificate path discovery in mobile Ad Hoc networks



He Huang, Shyhtsun Felix Wu

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14 The effects of interactive graphics and text on social influence in computer-mediated small groups



Jozsef A. Toth

October 1994 **Proceedings of the 1994 ACM conference on Computer supported cooperative work**

Full text available:  [pdf\(1.48 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Computer-mediated small group research has focused efforts on the medium of electronically networked text-based messages. An experiment which instead combines a synchronous text-based messaging medium with two-dimensional interactive computer

graphics is detailed. Three-person groups participated in a risk-taking choice-dilemma task involving a discussion of the dilemma and consensus attainment. The groups' prediscussion and postdiscussion opinions were collected. Two conditions, one where ...

Keywords: computer-mediated small group, discourse analysis, human factors, interactive computer graphics, perceptual and cognitive persistence, small group decision-making, social influence

15 Tree-based group key agreement

Yongdae Kim, Adrian Perrig, Gene Tsudik

February 2004 **ACM Transactions on Information and System Security (TISSEC)**, Volume 7 Issue 1

Full text available:  [pdf\(573.70 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Secure and reliable group communication is an active area of research. Its popularity is fueled by the growing importance of group-oriented and collaborative applications. The central research challenge is secure and efficient group key management. While centralized methods are often appropriate for key distribution in large multicast-style groups, many collaborative group settings require distributed key agreement techniques. This work investigates a novel group key agreement approach which ble ...

Keywords: communication complexity, cryptographic protocols, group communication, group key agreement, security

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Paul Castro, Benjamin Greenstein, Richard Muntz, Parviz Kermani, Chatschik Bisdikian, Maria Papadopoulou

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Norman W. Paton, Oscar Díaz

March 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 1

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Keywords: CSCW, UIMS, constraint maintenance, synchronous groupware**19 Launching the new era**

Kazuhiro Fuchi, Robert Kowalski, Koichi Furukawa, Kazunori Ueda, Ken Kahn, Takashi Chikayama, Evan Tick

March 1993 **Communications of the ACM**, Volume 36 Issue 3Full text available:  [pdf\(3.45 MB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#), [review](#)**20 Special issue on computational phonology: Phonological analysis in typed feature systems**

Steven Bird, Ewan Klein

September 1994 **Computational Linguistics**, Volume 20 Issue 3Full text available:  [pdf\(2.19 MB\)](#)  [Publisher Site](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Research on constraint-based grammar frameworks has focused on syntax and semantics largely to the exclusion of phonology. Likewise, current developments in phonology have generally ignored the technical and linguistic innovations available in these frameworks. In this paper we suggest some strategies for reuniting phonology and the rest of grammar in the context of a uniform constraint formalism. We explain why this is a desirable goal, and we present some conservative extensions to current pra ...



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L23	1095	20 xor 21 20 and 21	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:10
L24	5056	22 xor 23 22 and 23	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:10
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L26	397937	3 with 4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:13
L27	2	24 and 25	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:14
L28	1	27 and @ad<="20010117"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:16
L29	5739	26 and 12	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:16
L30	38	29 and 24	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:40
L31	22	30 and @ad<="20010117"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:16
L32	0	29 and 15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:40
L33	26	1 and 15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:41
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L36	49	4 and 15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:41
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L38	2	12 and 15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:41
L39	27	13 and 15	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/14 20:43
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1 [Heuristics, Experimental Subjects, and Treatment Evaluation in Bigraph Crossing Minimization](#)



Matthias Stallmann, Franc Brglez, Debabrata Ghosh

January 2001 **Journal of Experimental Algorithmics (JEA)**, Volume 6Full text available: [pdf\(858.74 KB\)](#) [ps\(3.01 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The bigraph crossing problem, embedding the two node sets of a bipartite graph along two parallel lines so that edge crossings are minimized, has applications to circuit layout and graph drawing. Experimental results for several previously known and two new heuristics suggest continued exploration of the problem, particularly sparse instances. We emphasize careful design of experimental subject classes and present novel views of the results. All source code, data, and scripts are available on-li ...

Keywords: crossing number, design of experiments, graph drawing, graph embedding, graph equivalence classes, layout

2 [RBAC support in object-oriented role databases](#)



Raymond K. Wong

November 1997 **Proceedings of the second ACM workshop on Role-based access control**Full text available: [pdf\(1.45 MB\)](#)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: database security, object-oriented role database, role-based access control

3 [Certificate-based authorization policy in a PKI environment](#)



Mary R. Thompson, Abdellilah Essiari, Srilekha Mudumbai

November 2003 **ACM Transactions on Information and System Security (TISSEC)**, Volume 6 Issue 4Full text available: [pdf\(233.63 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The major emphasis of public key infrastructure has been to provide a cryptographically secure means of authenticating identities. However, procedures for authorizing the holders of these identities to perform specific actions still need additional research and


development. While there are a number of proposed standards for authorization structures and protocols such as KeyNote, SPKI, and SAML based on X.509 or other key-based identities, none have been widely adopted. As part of an effort to us ...

Keywords: Public key infrastructure, XML, digital certificates

4 Access control with IBM Tivoli access manager

Günter Karjoth

May 2003 **ACM Transactions on Information and System Security (TISSEC)**, Volume 6
Issue 2

Full text available:  [pdf\(367.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Web presence has become a key consideration for the majority of companies and other organizations. Besides being an essential information delivery tool, the Web is increasingly being regarded as an extension of the organization itself, directly integrated with its operating processes. As this transformation takes place, security grows in importance. IBM Tivoli Access Manager offers a shared infrastructure for authentication and access management, technologies that have begun to emerge in the com ...

Keywords: Access control, WWW security, Web servers, authorization management

5 Security in VANET: Efficient attribute authentication with applications to ad hoc networks

Markus Jakobsson, Susanne Wetzel

October 2004 **Proceedings of the first ACM workshop on Vehicular ad hoc networks**

Full text available:  [pdf\(194.82 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


We present a family of certification methods with applications to attribute certification, which in turn has ample applications to ad hoc networks by way of the use of centrally managed recommendation mechanisms. Our construction is based on a Merkle tree consisting of subtrees, each of which corresponds to some aspect of an attribute. We study how the ordering of these subtrees can impact the cost of representing, maintaining, and verifying attribute certificates. We describe the applicability ...

Keywords: attribute authority, certificate, cryptography, hash graphs, light-weight, recommendation, spatial Merkle tree

6 A role-based access control model and reference implementation within a corporate intranet

David F. Ferraiolo, John F. Barkley, D. Richard Kuhn

February 1999 **ACM Transactions on Information and System Security (TISSEC)**, Volume 2
Issue 1

Full text available:  [pdf\(252.60 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes NIST's enhanced RBAC model and our approach to designing and implementing RBAC features for networked Web servers. The RBAC model formalized in this paper is based on the properties that were first described in Ferraiolo and Kuhn [1992] and Ferraiolo et al. [1995], with adjustments resulting from experience gained by prototype implementations, market analysis, and observations made by Jansen [1988] and Hoffman [1996]. The implementation of RBAC for the Web (RBAC/Web) p ...

Keywords: RBAC, Web arrows, World Wide Web, access control, authorization

management, role based access

7 Improving the granularity of access control for Windows 2000

Michael M. Swift, Anne Hopkins, Peter Brundrett, Cliff Van Dyke, Praerit Garg, Shannon Chan, Mario Goertzel, Gregory Jensenworth

November 2002 **ACM Transactions on Information and System Security (TISSEC)**, Volume 5 Issue 4

Full text available:  [pdf\(447.78 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This article presents the mechanisms in Windows 2000 that enable fine-grained and centrally managed access control for both operating system components and applications. These features were added during the transition from Windows NT 4.0 to support the Active Directory, a new feature in Windows 2000, and to protect computers connected to the Internet. While the access control mechanisms in Windows NT are suitable for file systems and applications with simple requirements, they fall short of the ...



Keywords: Access control lists, Microsoft Windows 2000, Windows NT, active directory

8 Special issue on computational phonology: Phonological analysis in typed feature systems

Steven Bird, Ewan Klein

September 1994 **Computational Linguistics**, Volume 20 Issue 3

Full text available:

 [pdf\(2.19 MB\)](#) 
[Publisher Site](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Research on constraint-based grammar frameworks has focused on syntax and semantics largely to the exclusion of phonology. Likewise, current developments in phonology have generally ignored the technical and linguistic innovations available in these frameworks. In this paper we suggest some strategies for reuniting phonology and the rest of grammar in the context of a uniform constraint formalism. We explain why this is a desirable goal, and we present some conservative extensions to current pra ...

9 Protecting information on the Web

Elisa Bertino, Elena Pagani, Gian Paolo Rossi, Pierangela Samarati

November 2000 **Communications of the ACM**

Full text available:  [pdf\(461.10 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

10 Delegation logic: A logic-based approach to distributed authorization

Ninghui Li, Benjamin N. Grosz, Joan Feigenbaum

February 2003 **ACM Transactions on Information and System Security (TISSEC)**, Volume 6 Issue 1

Full text available:  [pdf\(316.24 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We address the problem of authorization in large-scale, open, distributed systems. Authorization decisions are needed in electronic commerce, mobile-code execution, remote resource sharing, privacy protection, and many other applications. We adopt the trust-management approach, in which "authorization" is viewed as a "proof-of-compliance" problem: Does a set of credentials prove that a request complies with a policy? We develop a logic-based language, called *Delegation Logic* (DL), t ...

Keywords: Access control, Delegation Logic, distributed system security, logic programs,

trust management

11 Distributed operating systems

Andrew S. Tanenbaum, Robbert Van Renesse

December 1985 **ACM Computing Surveys (CSUR)**, Volume 17 Issue 4

Full text available:  [pdf\(5.49 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Distributed operating systems have many aspects in common with centralized ones, but they also differ in certain ways. This paper is intended as an introduction to distributed operating systems, and especially to current university research about them. After a discussion of what constitutes a distributed operating system and how it is distinguished from a computer network, various key design issues are discussed. Then several examples of current research projects are examined in some detail ...



12 Testbed directions and experience: Experience with an evolving overlay network testbed

David G. Andersen, Hari Balakrishnan, M. Frans Kaashoek, Robert Morris

July 2003 **ACM SIGCOMM Computer Communication Review**, Volume 33 Issue 3

Full text available:  [pdf\(115.26 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)


The MIT RON testbed consists of 36 Internet-connected nodes at 31 different sites. It has been in operation for two years. This paper presents an overview of the testbed, summarizes some of the research for which it has proved useful, and presents the lessons we learned during its development. The testbed has been useful both for our own research and for that of external researchers because of its heterogeneous, diverse network connections; its homogeneous hardware and software platform; its inc ...



13 Reading text from computer screens

Carol Bergfeld Mills, Linda J. Weldon

December 1987 **ACM Computing Surveys (CSUR)**, Volume 19 Issue 4

Full text available:  [pdf\(3.33 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


This paper reviews empirical studies concerning the readability of text from computer screens. The review focuses on the form and physical attributes of complex, realistic displays of text material. Most studies comparing paper and computer screen readability show that screens are less readable than paper. There are many factors that could affect the readability of computer screens. The factors explored in this review are the features of characters, the formatting of the screen, the contrast ...



14 Locating application data across service discovery domains

Paul Castro, Benjamin Greenstein, Richard Muntz, Parviz Kermani, Chatschik Bisdikian, Maria Papadopoulou

July 2001 **Proceedings of the 7th annual international conference on Mobile computing and networking**

Full text available:  [pdf\(4.38 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The bulk of proposed pervasive computing devices such as PDAs and cellular telephones operate as thin clients within a larger infrastructure. To access services within their local environment, these devices participate in a service discovery protocol which involves a master directory that registers all services available in the local environment. These directories typically are isolated from each other. Devices that move across service discovery domains have no access to information outside t ...



15 Securing context-aware applications using environment roles

Michael J. Covington, Wende Long, Srividhya Srinivasan, Anind K. Dev, Mustaque Ahamad, Gregory D. Abowd

May 2001 **Proceedings of the sixth ACM symposium on Access control models and technologies**

Full text available:  pdf(131.07 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


In the future, a largely invisible and ubiquitous computing infrastructure will assist people with a variety of activities in the home and at work. The applications that will be deployed in such systems will create and manipulate private information and will provide access to a variety of other resources. Securing such applications is challenging for a number of reasons. Unlike traditional systems where access control has been explored, access decisions may depend on the context in which re ...

Keywords: context aware computing, role-based access control

16 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available:  pdf(4.21 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

17 Authentication: An approach to certificate path discovery in mobile Ad Hoc networks

He Huang, Shyhtsun Felix Wu

October 2003 **Proceedings of the 1st ACM workshop on Security of ad hoc and sensor networks**

Full text available:  pdf(146.93 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Public key certificates prove validity and authenticity of their ownership and possibly other properties. Certificate path discovery is the critical process for public key verification in hierarchical public key infrastructure (PKI) diagrams. This process is conventionally done in centralized public key management system such as central CA or directory. However, in an infrastructure-less environment, such as a mobile ad hoc network, no such central service is present due to network dynamics. Tha ...

Keywords: MANET, certificate path discovery, public key infrastructure, security

18 Tree-based group key agreement

Yongdae Kim, Adrian Perrig, Gene Tsudik

February 2004 **ACM Transactions on Information and System Security (TISSEC)**, Volume 7 Issue 1

Full text available:  pdf(573.70 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Secure and reliable group communication is an active area of research. Its popularity is fueled by the growing importance of group-oriented and collaborative applications. The central research challenge is secure and efficient group key management. While centralized

methods are often appropriate for key distribution in large multicast-style groups, many collaborative group settings require distributed key agreement techniques. This work investigates a novel group key agreement approach which ble ...

Keywords: communication complexity, cryptographic protocols, group communication, group key agreement, security

19 Fault tolerance under UNIX

Anita Borg, Wolfgang Blau, Wolfgang Graetsch, Ferdinand Herrmann, Wolfgang Oberle
January 1989 **ACM Transactions on Computer Systems (TOCS)**, Volume 7 Issue 1


Full text available:  [pdf\(1.97 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The initial design for a distributed, fault-tolerant version of UNIX based on three-way atomic message transmission was presented in an earlier paper [3]. The implementation effort then moved from Auragen Systems1 to Nixdorf Computer where it was completed. This paper describes the working system, now known as the TARGON/32. The original design left open questions in at least two areas: fault tolerance for server processes and recovery after a crash were brie ...

20 Development of the domain name system

P. Mockapetris, K. J. Dunlap
August 1988 **ACM SIGCOMM Computer Communication Review , Symposium proceedings on Communications architectures and protocols**, Volume 18 Issue 4

Full text available:  [pdf\(1.24 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The Domain Name System (DNS) provides name service for the DARPA Internet. It is one of the largest name services in operation today, serves a highly diverse community of hosts, users, and networks, and uses a unique combination of hierarchies, caching, and datagram access. This paper examines the ideas behind the initial design of the DNS in 1983, discusses the evolution of these ideas into the current implementations and usages, notes conspicuous surprises, successes and shortc ...

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Medical Imaging, IEEE Transactions on
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Medical Imaging, IEEE Transactions on
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